

## Material Safety Data Sheet

Date Printed: 15/DEC/2004

Date Updated: 26/AUG/2004

Version 1.8

According to 91/155/EEC

## 1 - Product and Company Information

Product Name	TRICHLOROETHYLENE, STANDARD FOR GC
Product Number	02667
Company	Sigma-Aldrich Pte Ltd #08-01 Citilink Warehouse Singapore 118529 Singapore
Technical Phone #	65 271 1089
Fax	65 271 1571

## 2 - Composition/Information on Ingredients

Product Name	CAS #	EC no	Annex I Index Number
1,1,2-TRICHLOROETHYLENE	79-01-6	201-167-4	602-027-00-9

Formula	C2HCl3
Molecular Weight	131.39 AMU
Synonyms	Acetylene trichloride * Algylen * Anamenth * Benzinol * Blacosolv * Blancosolv * Cecolene * Chlorilen * 1-Chloro-2,2-dichloroethylene * Chlorylen * Circosolv * Crawhaspol * Densinfluat * 1,1-Dichloro-2-chloroethylene * Dow-tri * Dukeron * Ethinyl trichloride * Ethylene trichloride * Fleck-flip * Flock FLIP * Fluate * Germalgene * Lanadin * Lethurin * Narcogen * Narkosoid * NCI-C04546 * Nialk * Perm-A-chlor * Petzinol * Philex * RCRA waste number U228 * Threthylen * Threthylene * Trethylene * Tri * Triad * Trial * Triasol * Trichlooretheen (Dutch) * Trichloorethyleen, tri (Dutch) * Trichloraethen (German) * Trichloraethylen, tri (German) * Trichloran * Trichloren * Trichlorethylene, tri (French) * Trichloroethene * Trichloroethylene (IUPAC) * 1,1,2-Trichloroethylene * 1,2,2-Trichloroethylene * Trichloroethylene (ACGIH:OSHA) * Tri-clene * Tricloreten (Italian) * Tricloroetilene (Italian) * Trielene * Trielin * Trielina (Italian) * Trieline * Trilen * Trilene * Trilene TE-141 * Triline *

## 3 - Hazards Identification

## SPECIAL INDICATION OF HAZARDS TO HUMANS AND THE ENVIRONMENT

May cause cancer. Irritating to eyes and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Vapors may cause drowsiness and dizziness. Also possible risks of irreversible effects.

Muta. Cat.3 Carc. Cat.2

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## 4 - First Aid Measures

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### AFTER INHALATION

If inhaled, remove to fresh air. If breathing becomes difficult, call a physician.

### AFTER SKIN CONTACT

In case of contact, immediately wash skin with soap and copious amounts of water.

### AFTER EYE CONTACT

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

### AFTER INGESTION

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

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## 5 - Fire Fighting Measures

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### EXTINGUISHING MEDIA

Suitable: Water spray. Carbon dioxide, dry chemical powder, or appropriate foam.

### SPECIAL RISKS

Specific Hazard(s): Emits toxic fumes under fire conditions.

### SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

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## 6 - Accidental Release Measures

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PERSONAL PRECAUTION PROCEDURES TO BE FOLLOWED IN CASE OF LEAK OR SPILL  
Evacuate area.

### PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use.

### METHODS FOR CLEANING UP

Absorb on sand or vermiculite and place in closed containers for disposal. Ventilate area and wash spill site after material pickup is complete.

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## 7 - Handling and Storage

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### HANDLING

Directions for Safe Handling: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

### STORAGE

Conditions of Storage: Keep tightly closed. Handle and store under nitrogen. Store in a cool dry place.

SPECIAL REQUIREMENTS: Light sensitive. Handle and store under inert gas.

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## ENGINEERING CONTROLS

Use only in a chemical fume hood. Safety shower and eye bath.

## GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Wash thoroughly after handling.

## EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	50 MG/M3
Poland		NDSCh	400 MG/M3
Poland		NDSP	-

## EXPOSURE LIMITS - DENMARK

Source	Type	Value
OEL	TWA	55 mg/m3
		10 ppm

Remarks: K

## EXPOSURE LIMITS - GERMANY

Source	Type	Value
TRGS 900	OEL	165 mg/m3
		30 ppm

Remarks: 4

Remarks: TRK

## EXPOSURE LIMITS - NORWAY

Source	Type	Value
	OEL	50 mg/m3
		10 ppm

Remarks: K

## EXPOSURE LIMITS - SWEDEN

Source	Type	Value
	LLV (Level	50 mg/m3
		10 ppm

Remarks: K

## EXPOSURE LIMITS - SWITZERLAND

Source	Type	Value
OEL	OEL	260 mg/m3
		50 ppm

## EXPOSURE LIMITS - UNITED KINGDOM

Source	Type	Value
OEL	OEL	550 mg/m3
		100 ppm
OEL	STEL	820 mg/m3
		150 ppm

Remarks: Skin

## PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: Government approved respirator in nonventilated areas and/or for exposure above the TLV or PEL.

Hand Protection: Compatible chemical-resistant gloves.

Eye Protection: Chemical safety goggles.

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9 - Physical and Chemical Properties

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Appearance

Physical State: Clear liquid

Color: Colorless

Property	Value	At Temperature or Pressure
pH	N/A	
BP/BP Range	86 - 88 °C	
MP/MP Range	-84.8 °C	
Flash Point	N/A	
Flammability	N/A	
Autoignition Temp	410 °C	
Oxidizing Properties	N/A	
Explosive Properties	N/A	
Explosion Limits	Lower: 8 % Upper: 10.5 %	
Vapor Pressure	61 mmHg	20 °C
SG/Density	1.463 g/cm3	
Partition Coefficient	Log Kow: 2.29	
Viscosity	N/A	
Vapor Density	4.5 g/l	
Saturated Vapor Conc.	N/A	
Evaporation Rate	N/A	
Bulk Density	N/A	
Decomposition Temp.	N/A	
Solvent Content	N/A	
Water Content	N/A	
Surface Tension	N/A	
Conductivity	N/A	
Miscellaneous Data	N/A	
Solubility	N/A	

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## 10 - Stability and Reactivity

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### STABILITY

Stable: Stable.

Conditions of Instability: Light sensitive.

Materials to Avoid: Oxidizing agents, Strong bases, Magnesium.

### HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide, Hydrogen chloride gas.

### HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

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## 11 - Toxicological Information

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RTECS NUMBER: KX4550000

### ACUTE TOXICITY

LDLO

Oral

Human

7000 mg/kg

LCLO

Inhalation

Man

2,900 ppm

LD50

Oral

Rat  
4920 mg/kg

LD50  
Intraperitoneal  
Rat  
1282 MG/KG

LD50  
Oral  
Mouse  
2402 mg/kg  
Remarks: Behavioral:Altered sleep time (including change in  
righting reflex). Behavioral:Ataxia. Skin and Appendages: Other:  
Hair.

LC50  
Inhalation  
Mouse  
8,450 ppm  
4H

LD50  
Subcutaneous  
Mouse  
16 GM/KG  
Remarks: Behavioral:Sleep. Behavioral:Ataxia.

LD50  
Intravenous  
Mouse  
33900 UG/KG

LD50  
Intraperitoneal  
Dog  
1900 MG/KG  
Remarks: Liver:Liver function tests impaired.

LD50  
Skin  
Rabbit  
> 20000 mg/kg

#### IRRITATION DATA

Skin  
Rabbit  
2 mg  
24H  
Remarks: Severe irritation effect

Eyes  
Rabbit  
20 mg  
24H  
Remarks: Moderate irritation effect

#### SIGNS AND SYMPTOMS OF EXPOSURE

Symptoms of exposure may include burning sensation, coughing,  
wheezing, laryngitis, shortness of breath, headache, nausea, and  
vomiting. Exposure to and/or consumption of alcohol may increase

toxic effects. Exposure can cause: Gastrointestinal disturbances. Damage to the kidneys. Narcotic effect.

#### ROUTE OF EXPOSURE

Skin Contact: May cause skin irritation.  
Skin Absorption: May be harmful if absorbed through the skin.  
Eye Contact: May cause eye irritation.  
Inhalation: Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if inhaled.  
Ingestion: May be harmful if swallowed.

#### TARGET ORGAN INFORMATION

Liver. Central nervous system. Heart. Lungs.

#### CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that has been reported to be probably carcinogenic based on its IARC, OSHA, ACGIH, NTP, or EPA classification.

##### Rat

Route of Application: Inhalation  
Exposure Time: 7H/2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors. Skin and Appendages: Other: Tumors.

##### Mouse

Route of Application: Oral  
Exposure Time: 78W  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

##### Mouse

Route of Application: Inhalation  
Exposure Time: 7H/2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria.  
Vascular: Tumors. Lungs, Thorax, or Respiration: Tumors.

##### Hamster

Route of Application: Inhalation  
Exposure Time: 6H/77W  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Blood: Lymphomas including Hodgkin's disease.  
Liver: Tumors.

##### Mouse

Route of Application: Oral  
Exposure Time: 78W  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Liver: Tumors.

##### Mouse

Route of Application: Inhalation  
Exposure Time: 6H/77W  
Result: Tumorigenic: Equivocal tumorigenic agent by RTECS criteria. Blood: Lymphomas including Hodgkin's disease.

##### Mouse

Route of Application: Inhalation  
Exposure Time: 7H/2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria. Lungs, Thorax, or Respiration: Tumors. Skin and Appendages: Other: Tumors.

Mouse  
Route of Application: Oral  
Exposure Time: 2Y  
Result: Tumorigenic: Carcinogenic by RTECS criteria.  
Liver: Tumors. Blood: Tumors.

#### IARC CARCINOGEN LIST

Rating: Group 2A

#### CHRONIC EXPOSURE - MUTAGEN

Result: Laboratory experiments have shown mutagenic effects.

Human  
100 MG/L  
Cell Type: lung  
Unscheduled DNA synthesis

Human  
5 ML/L  
Cell Type: lymphocyte  
DNA inhibition

Human  
178 MG/L  
Cell Type: lymphocyte  
Sister chromatid exchange

Rat  
5 PPM  
Inhalation  
6H  
Micronucleus test

Rat  
4 MMOL/KG  
Oral  
Micronucleus test

Rat  
1100 UMOL/L  
Cell Type: Embryo  
Morphological transformation.

Rat  
100 UMOL/L  
Cell Type: liver  
DNA damage

Rat  
2800 UMOL/L  
Cell Type: liver  
Unscheduled DNA synthesis

Rat  
16500 MG/KG  
Oral  
3W  
Unscheduled DNA synthesis

Mouse  
1 GM/KG

Intraperitoneal  
Micronucleus test

Mouse  
146 MG/L (+S9)  
Cell Type: lymphocyte  
Mutation in microorganisms

Mouse  
140 MG/KG  
Intraperitoneal  
specific locus test

Mouse  
20 MG/L  
Cell Type: Embryo  
Morphological transformation.

Mouse  
6 MMOL/KG  
Intraperitoneal  
DNA damage

Mouse  
100 UMOL/L  
Cell Type: liver  
DNA damage

Mouse  
2500 MG/L  
Oral  
Unscheduled DNA synthesis

Mouse  
1 MMOL/L  
Cell Type: Bone marrow  
Unscheduled DNA synthesis

Mouse  
600 MG/KG  
Oral  
Other mutation test systems

Mouse  
400 MG/KG  
Cell Type: S. cerevisiac  
Host-mediated assay

Mouse  
100 PPM  
Inhalation  
sperm

Hamster  
5 MG/L  
Cell Type: Embryo  
Morphological transformation.

Hamster  
1 PPH  
Cell Type: fibroblast  
Other mutation test systems



Hamster  
401 MG/L  
Cell Type: ovary  
Sister chromatid exchange

Hamster  
1150 UMOL/L  
Cell Type: lung  
SLN

Mammal  
1 MMOL/L  
Cell Type: lymphocyte  
DNA

#### CHRONIC EXPOSURE - TERATOGEN

Species: Rat  
Dose: 1140 MG/KG  
Route of Application: Oral  
Exposure Time: (14D PRE-21D POST)  
Result: Specific Developmental Abnormalities: Central nervous system.

Species: Rat  
Dose: 1800 PPM/24H  
Route of Application: Inhalation  
Exposure Time: (1-20D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system. Specific Developmental Abnormalities: Other developmental abnormalities.

Species: Rat  
Dose: 1800 PPM/6H  
Route of Application: Inhalation  
Exposure Time: (1-20D PREG)  
Result: Specific Developmental Abnormalities: Urogenital system.

Species: Rat  
Dose: 100 PPM/4H  
Route of Application: Inhalation  
Exposure Time: (8-21D PREG)  
Result: Specific Developmental Abnormalities: Musculoskeletal system.

Species: Mouse  
Dose: 150 PPM/24H  
Route of Application: Inhalation  
Exposure Time: (4W MALE/4W PRE-3W PREG)  
Result: Specific Developmental Abnormalities: Central nervous system.

#### CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat  
Dose: 2688 MG/KG  
Route of Application: Oral  
Exposure Time: (1-22D PREG/21D POST)  
Result: Effects on Newborn: Behavioral.

Species: Rat

Dose: 36 GM/KG  
Route of Application: Oral  
Exposure Time: (15D PRE/1-21D PREG)  
Result: Effects on Newborn: Weaning or lactation index (e.g., #  
alive at weaning per # alive at day 4).

Species: Rat  
Dose: 100 PPM/4H  
Route of Application: Inhalation  
Exposure Time: (6-22D PREG)  
Result: Effects on Fertility: Post-implantation mortality (e.g.,  
dead and/or resorbed implants per total number of implants).  
Effects on Embryo or Fetus: Fetotoxicity (except death, e.g.,  
stunted fetus).

Species: Mouse  
Dose: 100 PPM/7H  
Route of Application: Inhalation  
Exposure Time: (5D MALE)  
Result: Paternal Effects: Spermatogenesis (including genetic  
material, sperm morphology, motility, and count).

CMR CAT.: Carc. Cat.2

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## 12 - Ecological Information

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BIOACCUMULATION POTENTIAL: No indication of  
bioaccumulation.

### ECOTOXICOLOGICAL EFFECTS

Test Type: LC50 Fish  
Species: Pimephales promelas (Fathead minnow)  
Time: 96 h  
Value: 41 mg/l

Test Type: EC50 Daphnia  
Species: Daphnia magna  
Time: 48 h  
Value: 18 mg/l

Test Type: IC50 Algae  
Species: Selenastrum capricornutum resp.  
Time: 96 h  
Value: 175 mg/l

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## 13 - Disposal Considerations

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### SUBSTANCE DISPOSAL

Contact a licensed professional waste disposal service to dispose  
of this material. Observe all federal, state, and local  
environmental regulations.

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## 14 - Transport Information

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### RID/ADR

UN#: 1710  
Class: 6.1  
PG: III  
Proper Shipping Name: Trichloroethylene

### IMDG

UN#: 1710  
Class: 6.1

PG: III  
Proper Shipping Name: Trichloroethylene  
Marine Pollutant: No  
Severe Marine Pollutant: No

#### IATA

UN#: 1710  
Class: 6.1  
PG: III  
Proper Shipping Name: Trichloroethylene  
Inhalation Packing Group I: No

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### 15 - Regulatory Information

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#### CLASSIFICATION AND LABELING ACCORDING TO EU DIRECTIVES

ANNEX I INDEX NUMBER: 602-027-00-9

NOTA: 6

INDICATION OF DANGER: T

Toxic.

R-PHRASES: 45 36/38 52/53 67 68

May cause cancer. Irritating to eyes and skin. Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Vapors may cause drowsiness and dizziness. Also possible risks of irreversible effects.

S-PHRASES: 53 61 45

Restricted to professional users. Attention - Avoid exposure - obtain special instructions before use. Avoid release to the environment. Refer to special instructions/safety data sheets. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

#### COUNTRY SPECIFIC INFORMATION

##### Germany

WGK: 3

##### SWITZERLAND

SWISS POISON CLASS: 4

##### NORWAY

Labelling for organic solvents where the package is 1liter or more.

YL-tall m3/l: 40880

YL-group: 5

Risk phrases: 20

Harmful by inhalation.

Safety phrases: 38 42 210

In case of insufficient ventilation, wear suitable respiratory equipment. During fumigation/spraying wear suitable respiratory equipment. Use compressed air- or fresh air line breathing apparatus in confined spaces.

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### 16 - Other Information

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#### WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc.,

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